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PATENT APPLICATION

ATTORNEY DOCKET NO. 100111538-1

IN THE  
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Paul D. Bliley, et al.

Confirmation No.: 1563

Application No.: 10/692,263

Examiner: Renata D. McCloud

Filing Date: October 23, 2003

Group Art Unit: 2837

Title: CONFIGURABLE H-BRIDGE CIRCUIT

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Commissioner For Patents  
PO Box 1450  
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TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on June 19, 2006.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

☐ 1st Month  
\$120

☐ 2nd Month  
\$450

☐ 3rd Month  
\$1020

☐ 4th Month  
\$1590

☐ The extension fee has already been filed in this application.

☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of \$ 500. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Respectfully submitted,

Paul D. Bliley, et al.

By 

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Docket No.: 100111538-1

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application No. : 10/692,263  
Appellants: : Paul D. Bliley, et al.  
Filed: : October 23, 2003  
TC/A.U. : 2837  
Examiner: : Renata D. McCloud  
Title: : Configurable H-Bridge Circuit

**APPEAL BRIEF**

MS APPEAL BRIEF-PATENTS  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir or Madame:

This brief is presented under 37 CFR § 41.37 in support of an appeal from a  
Final Office Action of June 6, 2006 regarding the above-identified application.

Notice of the Appeal was filed under 37 CFR § 41.31 on June 19, 2006. This brief  
is accompanied by the fee set forth in 37 CFR § 41.20(b)(2), as described in the  
accompanying TRANSMITTAL OF APPEAL BRIEF.

## **I. REAL PARTY IN INTEREST**

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A.

(hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

## **II. RELATED APPEALS AND INTERFERENCES**

Appellant submits that no related application is presently undergoing appeal or interference proceedings.

## **III. STATUS OF CLAIMS**

A. Total Claims: 1-34

B. Current Status of Claims:

1. Claims canceled: 2-3
2. Claims withdrawn: none
3. Claims pending: 1, and 4-34
4. Claims allowed: none
5. Claims rejected: 1, and 4-34
6. Claims objected to: none

C. Claims on Appeal: 1, and 4-34

## **IV. STATUS OF AMENDMENTS**

The Appellant has not filed any amendments to the application subsequent to the Final Office Action.

## **V. SUMMARY OF CLAIMED SUBJECT MATTER**

### **A. Independent claim 1**

Independent claim 1 recites a configurable H-bridge circuit including two high switches connected to a voltage source, two low switches connected to ground, a first configuration of the configurable H-bridge circuit with high switches and low switches connected together and coupled by closing switches to independently drive a motor as a first H-bridge circuit configuration, and a second configuration of the configurable H-bridge circuit in which the high switches serve as first components and the low switches serve as second components, wherein each are coupled by closing switches to form a discrete switch where one high switch is coupled as a first component of a switch supplying electricity to an electrically-powered component and one low switch is coupled as a second component of a switch supplying electricity to a different electrically-powered component, the second configuration being different than the first configuration. (Page 3, paragraphs 0006 and 0007; page 4, paragraph 0009 through page 6, paragraph 0016; page 7, paragraph 0017, through page 8, paragraph 0020; page 9, paragraphs 0023-0025; and Figures 1A-1B, 2, 3, and 4).

### **B. Independent claim 4**

Independent claim 4 recites an application-specific integrated circuit (ASIC) including a configurable first H-bridge circuit that by alternative closing of switches includes a first configuration as a first motor drive circuit to drive a first motor, and includes a second configuration as discrete switches, each of the discrete switches configured to be coupled to supply electricity to independent electrically-powered

components, and a configuration register configured to maintain an indicator of the configurable first H-bridge circuit configuration as at least one of the first motor drive circuit or as the discrete switches to supply electricity to independent electrically-powered components. (Page 3, paragraphs 0006-0008; page 4, paragraph 0009 through page 6, paragraph 0016; page 7, paragraph 0017, through page 8, paragraph 0020; page 9, paragraphs 0023-0025; and Figures 1A-1B, 2, 3, and 4).

Independent claim 4 is argued together with dependent claims 5-9.

C. Independent claim 10

Independent claim 10 recites a printing device including a first motor configured for movable control of at least a first component in the printing device, a second motor configured for movable control of at least a second component in the printing device, and a multiple H-bridge circuit including a first H-bridge circuit configured to independently drive the first motor, a second H-bridge circuit configured to independently drive the second motor, and a configurable third H-bridge circuit that includes by alternative closing of switches a first configuration as a motor drive circuit to independently drive a third motor, and includes a second configuration as discrete switches that are each configured to be coupled to a different component as a component switch. (Page 3, paragraphs 0006 and 0007; page 4, paragraph 0009 through page 6, paragraph 0016; page 7, paragraph 0017, through page 8, paragraph 0020; page 9, paragraphs 0023-0025; and Figures 1A-1B, 2, 3, 4, and 5).

Independent claim 10 is argued together with dependent claims 11-16.

D. Independent claim 17

Independent claim 17 recites a method including writing an indicator to a configuration register to indicate an implementation by alternative closing of switches of a configurable H-bridge circuit as at least one of a motor drive circuit or as discrete switches, coupling the configurable H-bridge circuit to drive a motor in an event that the configurable H-bridge circuit is implemented as the motor drive circuit, and coupling a discrete switch of the configurable H-bridge circuit as a component switch in an event that the configurable H-bridge circuit is implemented as the discrete switches to supply electricity to electrically-powered components. (Page 3, paragraphs 0006 and 0007; page 4, paragraph 0009 through page 6, paragraph 0016; page 7, paragraph 0017, through page 9, paragraph 0025; and Figures 1A-1B, 2, 3, and 4).

Independent claim 17 is argued together with dependent claims 18-22.

E. Independent claim 23

Independent claim 23 recites a method including controlling a first movable component in a printing device with a first motor independently driven by a first H-bridge circuit of a multiple H-bridge circuit, controlling a second movable component in the printing device with a second motor independently driven by a second H-bridge circuit of the multiple H-bridge circuit, configuring by alternative closing of switches a configurable third H-bridge circuit of the multiple H-bridge circuit in a first configuration to independently drive a third motor in an event that the third H-bridge circuit is to be implemented as a motor drive circuit, and configuring the third H-bridge circuit in a second configuration as discrete switches

that are each configured to be coupled to a different component in an event that a switch of the third H-bridge circuit is to be implemented as a component switch. (Page 3, paragraphs 0006 and 0007; page 4, paragraph 0009 through page 6, paragraph 0016; page 7, paragraph 0017, through page 8, paragraph 0020; page 9, paragraphs 0023-0025; and Figures 1A-1B, 2, 3, and 4).

Independent claim 23 is argued together with dependent claims 24-28.

F. Independent claim 29

Independent claim 29 recites one or more computer-readable media comprising computer executable instructions for executing directing a printing device, writing an indicator to a configuration register to indicate a configuration of a configurable H-bridge circuit as at least one of a motor drive circuit or as discrete switches by alternative closing of switches, configuring the configurable H-bridge circuit in a first configuration to drive a motor in an event that the configurable H-bridge circuit is to be implemented as the motor drive circuit, and configuring the configurable H-bridge circuit in a second configuration as the discrete switches in an event that a switch of the configurable H-bridge circuit is to be implemented as a component switch to supply electricity to independent electrically-powered components. (Page 3, paragraphs 0006 and 0007; page 4, paragraph 0009 through page 6, paragraph 0016; page 7, paragraph 0017, through page 9, paragraph 0025; and Figures 1A-1B, 2, 3, 4, and 5).

Independent claim 29 is argued together with dependent claim 30.

G. Independent claim 31

Independent claim 31 recites a printing device including means to independently drive a first motor to control a first movable component in a printing device, means to independently drive a second motor to control a second movable component in the printing device, means to configure by alternative closing of switches a configurable first H-bridge circuit in a first configuration as a motor drive circuit to independently drive a third motor, and means to configure by alternative closing of switches the configurable first H-bridge circuit in a second configuration as discrete switches to supply electricity to independent electrically-powered components. (Page 3, paragraphs 0006 and 0007; page 4, paragraph 0009 through page 6, paragraph 0016; page 7, paragraph 0017, through page 9, paragraph 0025; and Figures 1A-1B, 2, 3, 4, and 5).

Independent claim 31 is argued together with dependent claims 32-34.

## **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

A. Whether or not claims 1, and 4-34 are unpatentable under 35 USC § 112, first paragraph, as failing to comply with the written description requirement.

B. Whether or not claim 1 is unpatentable under 35 USC § 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention.

C. Whether or not claim 1 is unpatentable under 35 USC § 102(b) over Hella et al. (EP0833437) (Semiconductor Driver Commutation Element to Control Electrical Loads) in view of Appellant's allegedly admitted prior art.

D. Whether or not claims 1, 3-7, 17-22, and 29-30 are unpatentable under 35 USC § 103(a) over Hella et al. (DE4440064) (Circuit Arrangement for



Excitation of Electrical Loads, Such as Motor Vehicle Relays, Bulbs and Pilot Valves) in view of Appellant's allegedly admitted prior art.

E. Whether or not claims 8-9 are unpatentable under 35 USC § 103(a) over Hella et al. (DE4440064) and Appellant's allegedly admitted prior art as applied to independent claim 4, and further in view of Hella et al. (EP0833437).

F. Whether or not claims 10, 14-15, 23-25, and 31-34 are unpatentable under 35 USC § 103(a) over Barrus et al. (US 6,082,914) in view of Hella et al. (EP0833437) and Appellant's allegedly admitted prior art.

G. Whether or not claims 29-30 are unpatentable under 35 USC § 103(a) over Barrus et al. (US 6,082,914) in view of Hella et al. (EP0833437).

H. Whether or not claims 11-13, 16, and 26-28 are unpatentable under 35 USC § 103(a) over Barrus et al. (US 6,082,914), in view of Hella et al. (EP0833437) and Appellant's allegedly admitted prior art as applied to claims 10 and 23, and further in view of Hella (DE4440064).

## **VII. ARGUMENT**

A. Arguments against the rejections under 35 USC § 112, first paragraph, for failing to comply with the written description requirement.

1. Arguments regarding claims 1, and 4-34.

a. **The recited elements of claims 1, and 4-34 are described in the specification in such a way as to convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.**

Appellant submits that description sufficient to support the recited elements

of claims 1, and 4-34 is provided in the application as originally filed. As presented above as supporting material in the Summary of Claimed Subject Matter, particular sections of the specification of the present application describe, and particular figures illustrate, that a configurable H-bridge of the present disclosure can take on alternative configurations resulting from implementation of executable instructions. As shown in Figures 1A and 1B and Figure 2, and described in the accompanying description in the specification, the alternative configurations are interchangeable configurations of the same configurable H-bridge circuit.

More specifically, element 306 of Figure 3 recites the choice, “Motor drive circuit implementation?” and illustrates the choices as being “Yes” or “No” for the configurable H-bridge circuit. Selection of the Yes alternative in Figure 3 results in element 308 that recites, “Configure an H-bridge circuit control according to the indication that the H-bridge circuit is to be implemented to drive a motor”. As an alternative for the same configurable H-bridge circuit, selection of the No alternative results in element 314 that recites, “Configure an H-bridge circuit control according to the indication that the H-bridge circuit is to be implemented as discrete switches”.

Additionally, element 408 of Figure 4 recites the choice, “Discrete switches implementation?” and illustrates the choices as being “Yes” or “No” for the specified third H-bridge circuit of a multiple H-bridge circuit. Selection of the No alternative results in element 410 that recites, “Configure the third H-bridge circuit of the multiple H-bridge circuit as a motor circuit drive”. As an alternative for the third H-bridge circuit, selection of the Yes alternative results in element 414 that

recites, “Configure the third H-bridge circuit of the multiple H-bridge circuit as discrete switches”. As a consequence of configuring the third H-bridge circuit as discrete switches, element 416 recites, “Couple a switch of the third H-bridge circuit as a component switch”.

As such, it is apparent to one of ordinary skill in the relevant art that, by implementation of executable instructions, a single configurable H-bridge circuit can be configured in alternative configurations as a motor drive circuit, as H-bridge circuits are conventionally utilized, or as discrete switches that can be coupled to an “electrically-powered component” (which can be independent of the locale of the H-bridge circuit), as disclosed in the present application and recited in independent claims 1, 4, 17, 29, and 31. Being alternative configurations of the same circuit is recited in the claims; for example, independent claim 1, as previously presented, recites “a first configuration of the configurable H-bridge circuit” and “a second configuration of the configurable H-bridge circuit”. By preceding each configuration with “the”, antecedent basis requirements necessitate that the first and second alternative configurations are taken on by the same configurable H-bridge circuit.

As conceded by the Examiner in the Response to Arguments section of the June 6, 2006, Final Office Action, “An H-bridge functions by opening and closing switches”. As such, elements of claims reciting that mode of operation are inherently supported by the definition of an H-bridge circuit as understood by one of ordinary skill in the relevant art, which does not necessitate detailed description in the specification.

Hence, in light of the description of the alternative configurations provided in the specification and figures, as discussed above, Appellant submits that elements of claims reciting implementation of such alternative configurations by opening and closing switches do not require detailed supporting description because implementing alternative patterns of switch opening and closing for driving a motor in one direction or the other direction is an inherent characteristic of an H-bridge circuit, as previously appreciated by one of ordinary skill in the relevant art. For example, Appellant submits that the meaning of elements such as “wherein each are coupled by closing switches to form a discrete switch”, as recited in independent claim 1, and “alternative closing of switches”, as recited in independent claims 4, 10, 17, 23, 29, and 31, is appreciated by one of ordinary skill in the relevant art based upon the inherent characteristics of previously-known H-bridge circuits when considered in light of the accompanying description and figures in the present disclosure.

Additionally, it can be appreciated by one of ordinary skill in the relevant art that completing an operable H-bridge circuit can involve a first component of a switch and a second component of a switch, which can be represented by a high side switch and a low side switch, being closed to form a larger switch created from the first and second components. As appreciated by one of ordinary skill in the relevant art, no current flows to drive a motor in a desired direction in previously-known H-bridge circuits unless a high side switch on one side of the H-bridge and a low side switch on the other side of the H-bridge are closed, which can be considered a first component and a second component of a larger switch controlling operation of the

motor.

Hence, in light of the description of the alternative configurations provided in the specification and figures, as discussed above, Appellant submits that elements of claims reciting coupling of a high or low side switch as a first or second component of a switch do not require detailed supporting description because using a high side switch and a low side switch as two components of a larger switch for driving a motor in one direction or the other direction is an inherent characteristic of an H-bridge circuit, as previously appreciated by one of ordinary skill in the relevant art. For example, Appellant submits that the meaning of elements such as “one high switch is coupled as a first component of a switch” and “one low switch is coupled as a second component of a switch”, both recited in independent claim 1, is appreciated by one of ordinary skill in the relevant art based upon the inherent characteristics of previously-known H-bridge circuits when considered in light of the accompanying description and figures in the present disclosure.

Moreover, Appellant submits that referring to Figures 1A, 1B, 2, 3, and 4 while reading the accompanying description in the specification will convey to one of ordinary skill in the relevant art how alternative closing of switches in a configurable H-bridge circuit can accomplish the results recited in the claims for “a second configuration” of the same configurable H-bridge circuit that in “a first configuration” can drive a motor. For example, in independent claim 1, the meaning of, “wherein each are coupled by closing switches to form a discrete switch where one high switch is coupled as a first component of a switch supplying electricity to an electrically-powered component and one low switch is coupled as a

second component of a switch supplying electricity to a different electrically-powered component”, will be appreciated by one of ordinary skill in the relevant art by examination of Figure 1A and the elements associated with H-bridge circuit configuration 202(3) in Figure 2 in light of the accompanying description in the specification of the present disclosure.

Accordingly, Appellant respectfully requests reconsideration and withdrawal of the 112, first paragraph, rejection of claims 1, and 4-34.

B. Arguments against the rejections under 35 USC § 112, second paragraph, for being indefinite for failing to particularly point out and distinctly claim the subject matter that Appellant regards as the invention.

1. Arguments regarding claim 1.

a. **The elements of claim 1 are recited in the claim and supported in the specification in such a way as to particularly point out and distinctly claim the subject matter.**

The Examiner stated in the June 6, 2006, Final Office Action, “It is unclear what “each” refers to in line 9 of the claim.” The term “each” in line 9 of independent claim 1, as previously presented, is immediately preceded by, “a second configuration of the configurable H-bridge circuit in which the high switches serve as first components and the low switches serve as second components”. Appellant submits that, when analyzed logically or grammatically, “each” only can be referring to “the high switches serve as first components and the low switches serve as second components”, and, as such, “each” has adequate antecedent basis.

The Examiner further stated, “It is unclear how one high side switch is

coupled as a first component of a switch, when the high side switch is the switch.” The Examiner made a similar statement about it being unclear as to how a low side switch can be a second component of a switch. Appellant dealt with this issue above with regard to the 112, first paragraph, rejection.

To reiterate in short, in light of the description of the alternative configurations provided in the specification and figures, Appellant submits that elements of independent claim 1 reciting “one high switch is coupled as a first component of a switch” and “one low switch is coupled as a second component of a switch” are appreciated by one of ordinary skill in the relevant art because using a high side switch and a low side switch as two components of a larger switch for driving a motor in one direction or the other direction is a previously inherent characteristic of an H-bridge circuit.

Accordingly, Appellant respectfully requests reconsideration and withdrawal of the 112, second paragraph, rejection of independent claim 1, as previously presented, as well as those claims that depend therefrom.

C. Arguments against the rejection under 102(b) over the Hella ‘437 reference in view of Appellant’s allegedly admitted prior art.

1. Arguments regarding claim 1.

a. **For claim 1, the cited reference does not disclose each and every claimed element.**

Appellant submits that the Hella ‘437 reference appears to describe, “The semiconductor driver circuit element has individual quarter circuit bridge drivers, with a semiconductor chip (12) provided with a number of electronic switches (24,

26).” (Abstract). Hella ‘437 does not show a first configuration of the configurable H-bridge circuit with high switches and low switches connected together and coupled by closing switches to independently drive a motor as a first H-bridge circuit configuration and a second configuration of the configurable H-bridge circuit in which the high switches serve as first components and the low switches serve as second components, wherein each are coupled by closing switches to form a discrete switch where one high switch is coupled as a first component of a switch supplying electricity to an electrically-powered component and one low switch is coupled as a second component of a switch supplying electricity to a different electrically-powered component, the second configuration being different than the first configuration.

In contrast, Appellant’s independent claim 1, as previously presented, recites:

a first configuration of the configurable H-bridge circuit with high switches and low switches connected together and coupled by closing switches to independently drive a motor as a first H-bridge circuit configuration; and

a second configuration of the configurable H-bridge circuit in which the high switches serve as first components and the low switches serve as second components, wherein each are coupled by closing switches to form a discrete switch where one high switch is coupled as a first component of a switch supplying electricity to an electrically-powered component and one low switch is coupled as a second component of a switch supplying electricity to a different electrically-powered component, the second configuration being different than the first configuration.



Although the single figure of the Hella '437 reference appears to show three motors driven by what appear to be H-bridge circuits, one side of each H-bridge circuit for each motor is shared with another motor. This configuration differs from “coupled by closing switches to independently drive a motor as a first H-bridge circuit configuration”, as recited in independent claim 1, as previously presented. Moreover, it appears that the circuitry used for components 52 and 54 in the Hella '437 figure is not arranged in an H-bridge configuration as such, nor does it form a portion of the H-bridges driving the three motors, which differs from two electrically-powered components being “coupled by closing switches” of “a second configuration of the configurable H-bridge circuit”, as recited in independent claim 1, as previously presented. By reciting “the configurable H-bridge circuit” for the first and second configurations, the same H-bridge circuit is intended for each configuration. Hence, Appellant submits that the Hella '437 reference does not describe, teach, or suggest each and every element of the Appellant’s independent claim 1.

The embodiment of the present disclosure claimed in independent claim 1, as previously presented, differs from the Hella '437 reference even in light of the Final Office Action’s prior art contentions. The Final Office Action cited the Background section of the application and stated that “Applicant’s prior art teaches that it is well-known in the art that an H-bridge is configured to independently drive a motor.” (Section 7 of the June 6, 2006, Final Office Action). Appellant does not admit that it was well-known in the art that an H-Bridge is configured to independently drive a motor. However, Appellant respectfully submits that even if

it was well known to configure an H-bridge to independently drive a motor, this does not cure the deficiencies of the Hella '437 reference, as described above. That is, the above-cited Background section does not describe, teach, or suggest, "a first configuration of the configurable H-bridge circuit with high switches and low switches connected together and coupled by closing switches to independently drive a motor as a first H-bridge circuit configuration; and a second configuration of the configurable H-bridge circuit in which the high switches serve as first components and the low switches serve as second components" as recited in independent claim 1, as previously presented.

As such, Appellant respectfully submits that each and every element and limitation of independent claim 1, as previously presented, is not present in the Hella '437 reference or Appellant's allegedly admitted prior art. Accordingly, Appellant respectfully requests reconsideration and withdrawal of the 102 rejection of independent claim 1, as previously presented.

D. Arguments against the rejections under 103(a) over Hella '064 in view of Appellant's allegedly admitted prior art.

1. Arguments regarding claims 1, 3-7, 17-22, and 29-30.

a. **For claims 1, 3-7, 17-22, and 29-30, the cited reference and Appellant's allegedly admitted prior art do not describe, teach, or suggest each and every claimed element.**

With regard to independent claim 1, as previously presented, the Examiner cited the Hella '064 reference, referring to Figs. 1-3, as describing a number of elements of independent claim 1 of the present disclosure. Appellant does not admit

that the Hella '064 reference supports the description provided by the Examiner because the specification, figures, and claims of the Hella '064 reference are written in a manner that liberally intermixes English and German words, phrases, grammar, and syntax in such a manner as to make the document incomprehensible, or open to multiple interpretations, to a reader accustomed to using, and reading documents composed in, the English language.

As far as Appellant can determine, by showing no particular circuitry configuration in Figs. 1 or 2 with regard to driving the motor, and by showing every combination of T1, T2, T3, and T4 in Fig. 3 except T1 with T2, or T3 with T4, Hella '064 appears to describe a conventional H-bridge circuit. In addition, by stating, "One or more bridge circuits (B1, B2, B3, B4, BS) are each assigned a linking network (VN) which drives the load switch of the bridge circuit", the Hella '064 Abstract appears to describe a network that drives the load switch of the bridge circuit rather than an electrically-powered component to which electricity is supplied by a particular configuration of closed switches in an H-bridge circuit.

The Examiner appears to have interpreted Hella '064 to describe particular elements of Appellant's independent claim 1 as follows: "each are coupled (T1, T2, T3, T4 are coupled) by closing switches to form a discrete where one high switch (T1) is coupled as a first component switch to a component (T1 of X to 2Y) and the low switch is coupled to a different component (T4 of Y coupled to 2x)". (Section 6 of the June 6, 2006, Final Office Action). Appellant does not admit the accuracy of such an interpretation of the jumbled combination of English and German in the Hella '064 reference. Consistent with difficulty in clearly discerning the meaning of

the cited reference, the Examiner further stated in section 6 that “It is unclear if Hella teaches the switches coupled together to independently drive a motor.” By so stating, the Examiner has admitted that Hella ‘064 does not intelligibly teach to one of ordinary skill in the relevant art a single configurable H-bridge circuit having a first configuration to independently drive a motor and a second configuration to supply electricity to a different electrically-powered component.

With regard to Appellant’s allegedly admitted prior art, the Examiner stated that Appellant’s Background section “teaches that it is well known in the art that an H-bridge is configured to independently drive a motor”. However, the Background section of the specification recites, “The motor control ASIC is implemented with an H-bridge circuit structure that enables a microprocessor or controller to independently control each motor in an imaging device.” (Page 1, paragraph 0003).

As such, the recited statement from the Background section of Appellant’s application does not disclose that every H-bridge circuit is configured to independently drive a motor. Rather, the Background section discloses that a motor control ASIC implemented with an H-bridge circuit structure enables a microprocessor or controller to independently control each motor. Stating that a motor control ASIC can use “an H-bridge circuit structure” to control each motor does not connote that all H-bridge circuits control motors, either individually or as part of a circuit structure, especially in a situation where the H-bridge circuit is not controlled by a motor control ASIC.

Paragraph 0012 on page 5 of the present application recites, “Fig. 2 illustrates an exemplary application-specific integrated circuit (ASIC) in which

configurable H-bridge circuits 202(1), 202(2), and 202(3) can each be configured and implemented as discrete switches or as a motor drive circuit.” As such, an ASIC as disclosed in the present application is more than just “a motor control ASIC”.

Hence, neither Hella ‘064 nor Appellant’s allegedly admitted prior art shows a first configuration of the configurable H-bridge circuit with high switches and low switches connected together and coupled by closing switches to independently drive a motor as a first H-bridge circuit configuration, and a second configuration of the configurable H-bridge circuit in which the high switches serve as first components and the low switches serve as second components, wherein each are coupled by closing switches to form a discrete switch where one high switch is coupled as a first component of a switch supplying electricity to an electrically-powered component and one low switch is coupled as a second component of a switch supplying electricity to a different electrically-powered component, the second configuration being different than the first configuration.

In contrast, Appellant’s independent claim 1, as previously presented, recites:

a first configuration of the configurable H-bridge circuit with high switches and low switches connected together and coupled by closing switches to independently drive a motor as a first H-bridge circuit configuration; and

a second configuration of the configurable H-bridge circuit in which the high switches serve as first components and the low switches serve as second components, wherein each are coupled by closing switches to form a discrete switch where one high switch is

coupled as a first component of a switch supplying electricity to an electrically-powered component and one low switch is coupled as a second component of a switch supplying electricity to a different electrically-powered component, the second configuration being different than the first configuration.

Independent claim 4, as previously presented, recites:

a configurable first H-bridge circuit that by alternative closing of switches includes a first configuration as a first motor drive circuit to drive a first motor, and includes a second configuration as discrete switches, each of the discrete switches configured to be coupled to supply electricity to independent electrically-powered components;

Independent claim 17, as previously presented, recites:

coupling the configurable H-bridge circuit to drive a motor in an event that the configurable H-bridge circuit is implemented as the motor drive circuit; and

coupling a discrete switch of the configurable H-bridge circuit as a component switch in an event that the configurable H-bridge circuit is implemented as the discrete switches to supply electricity to electrically-powered components.

In addition, independent claim 29, as previously presented, recites:

configuring the configurable H-bridge circuit in a first configuration to drive a motor in an event that the configurable H-bridge circuit is to be implemented as the motor drive circuit; and  
configuring the configurable H-bridge circuit in a second configuration as the discrete switches in an event that a switch of the configurable H-bridge circuit is to be implemented as a component

switch to supply electricity to independent electrically-powered components.

As such, Appellant respectfully submits that each and every element and limitation of independent claims 1, 4, 17, and 29, as previously presented, is not described, taught, or suggested in the Hella '064 reference and Appellant's allegedly admitted prior art, either individually or in combination. Accordingly, Appellant respectfully requests reconsideration and withdrawal of the 103 rejection of independent claims 1, 4, 17, and 29, as previously presented, as well as those claims that depend therefrom. Dependent claim 3 has previously been canceled.

E. Arguments against the rejections under 103(a) over Hella '064 and Appellant's allegedly admitted prior art, and further in view of Hella '437.

1. Arguments regarding claims 8-9.

a. **For claims 8-9, the cited references and Appellant's allegedly admitted prior art do not describe, teach, or suggest each and every claimed element.**

Claims 8 and 9 depend from independent claim 4. Appellant respectfully submits that independent claim 4, as previously presented, is in condition for allowance in view of Hella '064 and Appellant's allegedly admitted prior art. From Appellant's review of the Hella '437 reference, the reference does not cure the deficiencies of Hella '064 and Appellant's allegedly admitted prior art. That is, Hella '437 does not describe, teach, or suggest, "a configurable first H-bridge circuit that by alternative closing of switches includes a first configuration as a first motor

drive circuit to drive a first motor, and includes a second configuration as discrete switches”, as recited in independent claim 4, as previously presented.

As such, Appellant respectfully submits that each and every element and limitation of independent claim 4, as previously presented, is not described, taught, or suggested in the Hella ‘064 reference, Appellant’s admitted prior art, and the Hella ‘437 reference, either individually or in combination. Accordingly, Appellant respectfully requests reconsideration and withdrawal of the 103 rejection of dependent claims 8-9.

F. Arguments against the rejections under 103(a) over Barrus in view of Hella ‘437 and Appellant’s allegedly admitted prior art.

1. Arguments regarding claims 10, 14-15, 23-25, and 31-34.

a. **For claims 10, 14-15, 23-25, and 31-34, the cited references and Appellant’s allegedly admitted prior art do not describe, teach, or suggest each and every claimed element.**

With regard to independent claim 10, as previously presented, the Examiner cites the Barrus reference as describing, “a third H-bridge circuit (304) that includes a first configuration as a motor drive circuit to drive a third motor (186).” (Section 9 of the June 6, 2006, Final Office Action). In Fig. 4, Barrus appears to show a “converter 272 is used to control the required current through the H bridge driver 274 for the D.C. motor 230.” (Col. 9, lines 12-14). Fig. 4 appears to show “an H bridge driver 296 connected to the motor 220”. (Col. 10, lines 45-46). Fig. 4 also appears to show “a stepper motor driver 304 is fundamentally an electric circuit that applies power to the stepper motor 186.” (Col. 10, line 67, through col. 11, line 2).



Hence, Barrus appears to describe two H-bridge drivers (274, 296) and one driver (304) that “is fundamentally an electric circuit”, rather than “a third H-bridge circuit (304) that includes a first configuration as a motor drive circuit to drive a third motor (186).”

Additionally, as stated above with regard to the 102 rejection, the figure of the Hella ‘437 reference appears to show three motors driven by what appear to be H-bridge circuits; one side of each H-bridge circuit for each motor is shared with another motor. This configuration differs from, “a first configuration as a motor drive circuit to independently drive a third motor”, as recited in independent claim 10, as previously presented. Moreover, it appears that the circuitry used for components 52 and 54 in the Hella ‘437 figure is not arranged in an H-bridge configuration as such, nor does it form a portion of the H-bridges driving the three motors, which differ from, as recited in independent claim 10, as previously presented:

a configurable third H-bridge circuit that includes by alternative closing of switches a first configuration as a motor drive circuit to independently drive a third motor, and includes a second configuration as discrete switches that are each configured to be coupled to a different component as a component switch.

By reciting, “a configurable third H-bridge circuit that includes by alternative closing of switches” “a first configuration as a motor drive circuit” and “a second configuration as discrete switches”, the same H-bridge circuit is intended for each configuration.

With regard to Appellant's allegedly admitted prior art, the Background section of the specification recites, "The motor control ASIC is implemented with an H-bridge circuit structure that enables a microprocessor or controller to independently control each motor in an imaging device." (Page 1, paragraph 0003). The Background does not describe, "a configurable third H-bridge circuit that includes by alternative closing of switches a first configuration as a motor drive circuit to independently drive a third motor, and includes a second configuration as discrete switches that are each configured to be coupled to a different component as a component switch" as recited by independent claim 10, as previously presented.

Independent claim 23, as previously presented, recites:

configuring by alternative closing of switches a configurable third H-bridge circuit of the multiple H-bridge circuit in a first configuration to independently drive a third motor in an event that the third H-bridge circuit is to be implemented as a motor drive circuit; and configuring the third H-bridge circuit in a second configuration as discrete switches that are each configured to be coupled to a different component in an event that a switch of the third H-bridge circuit is to be implemented as a component switch.

In addition, independent claim 31, as previously presented, recites:

means to configure by alternative closing of switches a configurable first H-bridge circuit in a first configuration as a motor drive circuit to independently drive a third motor; and

means to configure by alternative closing of switches the configurable first H-bridge circuit in a second configuration as discrete switches to supply electricity to independent electrically-

powered components.

As such, Appellant respectfully submits that each and every element and limitation of independent claims 10, 23, and 31, as previously presented, is not described, taught, or suggested in the Barrus and Hella '437 references, and Appellant's allegedly admitted prior art, either individually or in combination. Accordingly, Appellant respectfully requests reconsideration and withdrawal of the 103 rejection of independent claims 10, 23, and 31, as previously presented, as well as those claims that depend therefrom.

G. Arguments against the rejections under 103(a) over Barrus in view of Hella '437.

1. Arguments regarding claims 29-30.

a. **For claims 29-30, the cited references do not describe, teach, or suggest each and every claimed element.**

In section 10 of the June 6, 2006, Final Office Action, the Examiner stated "in view of Hella 437" in the heading for the rejection, but went on to describe material presented in the Hella '064 reference. Based thereon, Appellant will discuss Hella '064 in the following arguments instead of Hella '437.

In addition to the reasons provided above in section D. with regard to deficiencies of the Hella '064 reference relative to independent claim 29, as previously presented, from Appellant's review of the Barrus reference, the reference does not cure the deficiencies of Hella '064. That is, Barrus appears to show in Fig. 4 that a "converter 272 is used to control the required current through the H bridge driver 274 for the D.C. motor 230." (Col. 9, lines 12-14). Fig. 4 appears to show

“an H bridge driver 296 connected to the motor 220”. (Col. 10, lines 45-46). Fig. 4 also appears to show “a stepper motor driver 304 is fundamentally an electric circuit that applies power to the stepper motor 186.” (Col. 10, line 67, through col. 11, line 2). As such, Barrus appears to describe two H-bridge drivers (274, 296) and one driver (304) that “is fundamentally an electric circuit”, rather than “a third H-bridge circuit (304) that includes a first configuration as a motor drive circuit to drive a third motor (186)”, as stated by the Examiner.

Hence, neither the Hella ‘064 reference nor the Barrus reference, either individually or in combination, shows configuring a configurable H-bridge circuit in a first configuration to drive a motor in an event that the configurable H-bridge circuit is to be implemented as the motor drive circuit, and configuring the configurable H-bridge circuit in a second configuration as the discrete switches in an event that a switch of the configurable H-bridge circuit is to be implemented as a component switch to supply electricity to independent electrically-powered components.

In contrast, Appellant’s independent claim 29, as previously presented, recites:

configuring the configurable H-bridge circuit in a first configuration to drive a motor in an event that the configurable H-bridge circuit is to be implemented as the motor drive circuit; and  
configuring the configurable H-bridge circuit in a second configuration as the discrete switches in an event that a switch of the configurable H-bridge circuit is to be implemented as a component switch to supply electricity to independent electrically-powered components.

As such, Appellant respectfully submits that each and every element and limitation of independent claim 29, as previously presented, is not described, taught, or suggested in the Barrus and Hella '064 references, either individually or in combination. Accordingly, Appellant respectfully requests reconsideration and withdrawal of the 103 rejection of independent claim 29, as previously presented, as well as those claims that depend therefrom.

H. Arguments against the rejections under 103(a) over Barrus in view of Hella '437 and Appellant's allegedly admitted prior art, and further in view of Hella '064.

1. Arguments regarding claims 11-13, 16, and 26-28.

a. **For claims 11-13, 16, and 26-28, the cited references do not describe, teach, or suggest each and every claimed element.**

Claims 11-13, and 16 depend from independent claim 10 and claims 26-28 depend from independent claim 23. Appellant respectfully submits that, as presented above in section F., independent claims 10 and 23, as previously presented, are in condition for allowance in view of Barrus, Hella '437, and Appellant's allegedly admitted prior art. From Appellant's review of the Hella '064 reference, the reference does not cure the deficiencies of Barrus, Hella '437, and Appellant's allegedly admitted prior art. That is, as presented above in section D., Hella '064 does not describe, teach, or suggest:

a configurable third H-bridge circuit that includes by alternative closing of switches a first configuration as a motor drive circuit to independently drive a third motor, and includes a second

configuration as discrete switches that are each configured to be coupled to a different component as a component switch.

as recited in independent claim 10, as previously presented. Nor does Hella '064 describe, teach, or suggest:

configuring by alternative closing of switches a configurable third H-bridge circuit of the multiple H-bridge circuit in a first configuration to independently drive a third motor in an event that the third H-bridge circuit is to be implemented as a motor drive circuit; and configuring the third H-bridge circuit in a second configuration as discrete switches that are each configured to be coupled to a different component in an event that a switch of the third H-bridge circuit is to be implemented as a component switch.

as recited in independent claim 23, as previously presented.

As such, Appellant respectfully submits that each and every element and limitation of independent claims 10 and 23, as previously presented, is not described, taught, or suggested in the Barrus and Hella '437 references, Appellant's allegedly admitted prior art, and the Hella '064 reference, either individually or in combination. Accordingly, Appellant respectfully requests reconsideration and withdrawal of the 103 rejection of dependent claims 11-13, 16, and 26-28.

### CONCLUSION

Appellant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner and/or members of the Board are invited to telephone Appellant's attorney Gregg W. Wisdom at (360) 212-8052 to facilitate this appeal.

At any time during the pendency of this application, please charge any additional fees or credit overpayment to the Deposit Account No. 08-2025.

**CERTIFICATE UNDER 37 C.F.R. §1.8:** The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner for Patents, P.O. BOX 1450, Alexandria, VA 22313-1450, on this 9<sup>th</sup> day of August, 2006.

Sarah L. Reinhard

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8/9/2006

## **VIII. CLAIMS APPENDIX**

1. (Previously Presented) A configurable H-bridge circuit, comprising:
  - two high switches connected to a voltage source;
  - two low switches connected to ground;
  - a first configuration of the configurable H-bridge circuit with high switches and low switches connected together and coupled by closing switches to independently drive a motor as a first H-bridge circuit configuration; and
  - a second configuration of the configurable H-bridge circuit in which the high switches serve as first components and the low switches serve as second components, wherein each are coupled by closing switches to form a discrete switch where one high switch is coupled as a first component of a switch supplying electricity to an electrically-powered component and one low switch is coupled as a second component of a switch supplying electricity to a different electrically-powered component, the second configuration being different than the first configuration.
2. (Canceled)
3. (Canceled)
4. (Previously Presented) An application-specific integrated circuit (ASIC), comprising:



a configurable first H-bridge circuit that by alternative closing of switches includes a first configuration as a first motor drive circuit to drive a first motor, and includes a second configuration as discrete switches, each of the discrete switches configured to be coupled to supply electricity to independent electrically-powered components; and

a configuration register configured to maintain an indicator of the configurable first H-bridge circuit configuration as at least one of the first motor drive circuit or as the discrete switches to supply electricity to independent electrically-powered components.

5. (Previously Presented) An ASIC as recited in claim 4, wherein the configuration register maintains the indicator that the configurable first H-bridge circuit is configured as the discrete switches to supply electricity to independent electrically-powered components.

6. (Previously Presented) An ASIC as recited in claim 4, wherein the configuration register is further configured to maintain a switch indicator that indicates a configuration of a discrete switch to supply electricity to independent electrically-powered components.

7. (Previously Presented) An ASIC as recited in claim 4, wherein:  
the configurable first H-bridge circuit includes two high switches connected to a voltage source, and includes two low switches connected to ground; and

in the first configuration as a motor drive circuit, one high switch and one low switch are configured to be connected together and coupled by closing switches to drive the motor.

8. (Original) An ASIC as recited in claim 4, further comprising at least a second H-bridge circuit configured to drive a second motor.

9. (Previously Presented) An ASIC as recited in claim 4, further comprising: a second H-bridge circuit configured as a second motor drive circuit;

a third H-bridge circuit implemented as a third motor drive circuit; and

wherein the second H-bridge circuit is configured to drive the first motor and the third H-bridge circuit is configured to drive a second motor in an event that the configurable first H-bridge circuit is configured as the discrete switches.

10. (Previously Presented) A printing device, comprising:

a first motor configured for movable control of at least a first component in the printing device;

a second motor configured for movable control of at least a second component in the printing device;

a multiple H-bridge circuit including:

a first H-bridge circuit configured to independently drive the first motor;

a second H-bridge circuit configured to independently drive the second motor; and

a configurable third H-bridge circuit that includes by alternative closing of switches a first configuration as a motor drive circuit to independently drive a third motor, and includes a second configuration as discrete switches that are each configured to be coupled to a different component as a component switch.

11. (Previously Presented) A printing device as recited in claim 10, further comprising a configuration register configured to maintain an indicator of the configurable third H-bridge circuit configuration as at least one of the motor drive circuit or the discrete switches.

12. (Previously Presented) A printing device as recited in claim 10, further comprising a configuration register configured to maintain an indicator that the configurable third H-bridge circuit is configured as the discrete switches.

13. (Previously Presented) A printing device as recited in claim 10, further comprising a configuration register configured to maintain an indicator that the configurable third H-bridge circuit is configured as the discrete switches, the configuration register further configured to maintain a switch indicator that indicates a configuration of a discrete switch.

14. (Previously Presented) A printing device as recited in claim 10, wherein the

configurable third H-bridge circuit includes a high switch connected to a voltage source and includes a low switch connected to ground, and wherein the first configuration includes the high switch and the low switch connected together and coupled to drive the third motor.

15. (Previously Presented) A printing device as recited in claim 10, wherein the configurable third H-bridge circuit includes a high switch connected to a voltage source and includes a switch connected to ground, and wherein the second configuration includes at least one of the high switch and the low switch coupled as the component switch.

16. (Previously Presented) A printing device as recited in claim 10, further comprising an application-specific integrated circuit (ASIC) that includes the multiple H-bridge circuit, the ASIC further including a configuration register configured to maintain an indicator of the configurable third H-bridge circuit configuration.

17. (Previously Presented) A method, comprising:

- writing an indicator to a configuration register to indicate an implementation by alternative closing of switches of a configurable H-bridge circuit as at least one of a motor drive circuit or as discrete switches;
- coupling the configurable H-bridge circuit to drive a motor in an event that the configurable H-bridge circuit is implemented as the motor drive circuit; and

coupling a discrete switch of the configurable H-bridge circuit as a component switch in an event that the configurable H-bridge circuit is implemented as the discrete switches to supply electricity to electrically-powered components.

18. (Previously Presented) A method as recited in claim 17, further comprising maintaining the indicator of the implementation of the configurable H-bridge circuit, wherein the indicator indicates at least one of a first configuration of the configurable H-bridge circuit as the motor drive circuit and a second configuration of the configurable H-bridge circuit as the discrete switches to supply electricity to independent electrically-powered components.

19. (Original) A method as recited in claim 17, further comprising writing a switch indicator to the configuration register to indicate a configuration of the component switch.

20. (Previously Presented) A method as recited in claim 17, wherein coupling the configurable H-bridge circuit to drive the motor includes:

connecting an output of a high switch of the configurable H-bridge circuit to an input of a low switch of the configurable H-bridge circuit, the high switch connected to a voltage source and the low switch connected to ground; and

coupling the high switch and the low switch to drive the motor by closing the switches.

21. (Original) A method as recited in claim 17, further comprising configuring an H-bridge circuit control according to the indicator in the configuration register to couple the configurable H-bridge circuit to drive the motor in an event that the H-bridge circuit is implemented as the motor drive circuit.

22. (Previously Presented) A method as recited in claim 17, further comprising configuring an H-bridge circuit control according to the indicator in the configuration register to couple a switch of the configurable H-bridge circuit to a switched component in an event that the H-bridge circuit is implemented as the discrete switches to supply electricity to independent electrically-powered components.

23. (Previously Presented) A method, comprising:

- controlling a first movable component in a printing device with a first motor independently driven by a first H-bridge circuit of a multiple H-bridge circuit;
- controlling a second movable component in the printing device with a second motor independently driven by a second H-bridge circuit of the multiple H-bridge circuit;
- configuring by alternative closing of switches a configurable third H-bridge circuit of the multiple H-bridge circuit in a first configuration to independently drive a third motor in an event that the third H-bridge circuit is to be implemented as a motor drive circuit; and

configuring the third H-bridge circuit in a second configuration as discrete switches that are each configured to be coupled to a different component in an event that a switch of the third H-bridge circuit is to be implemented as a component switch.

24. (Previously Presented) A method as recited in claim 23, further comprising coupling the configurable third H-bridge circuit to drive the third motor in the first configuration.

25. (Previously Presented) A method as recited in claim 23, further comprising coupling the switch of the configurable third H-bridge circuit to a component in the second configuration.

26. (Previously Presented) A method as recited in claim 23, further comprising writing an indicator to a configuration register to indicate a configuration of the configurable third H-bridge circuit.

27. (Previously Presented) A method as recited in claim 23, further comprising: writing an indicator to a configuration register to indicate a configuration of the configurable third H-bridge circuit; and coupling the configurable third H-bridge circuit to drive the third motor in the first configuration according to the indicator maintained in the configuration register.

28. (Previously Presented) A method as recited in claim 23, further comprising:  
writing an indicator to a configuration register to indicate a configuration of the  
configurable third H-bridge circuit; and coupling the switch of the configurable  
third H-bridge circuit to a component in the second configuration according to the  
indicator maintained in the configuration register.

29. (Previously Presented) One or more computer-readable media comprising  
computer executable instructions for executing:

directing a printing device;

writing an indicator to a configuration register to indicate a configuration of  
a configurable H-bridge circuit as at least one of a motor drive circuit or as discrete  
switches by alternative closing of switches;

configuring the configurable H-bridge circuit in a first configuration to drive  
a motor in an event that the configurable H-bridge circuit is to be implemented as  
the motor drive circuit; and

configuring the configurable H-bridge circuit in a second configuration as  
the discrete switches in an event that a switch of the configurable H-bridge circuit is  
to be implemented as a component switch to supply electricity to independent  
electrically-powered components.

30. (Previously Presented) One or more computer-readable media as recited in  
claim 29, further comprising computer executable instructions for executing:



coupling an output of a high switch of the configurable H-bridge circuit to an input of a low switch of the configurable H-bridge circuit, the high switch connected to a voltage source and the low switch connected to ground; and

coupling the high switch and the low switch to the motor in the first configuration that the configurable H-bridge circuit is implemented as the motor drive circuit.

31. (Previously Presented) A printing device, comprising:

means to independently drive a first motor to control a first movable component in a printing device;

means to independently drive a second motor to control a second movable component in the printing device;

means to configure by alternative closing of switches a configurable first H-bridge circuit in a first configuration as a motor drive circuit to independently drive a third motor; and

means to configure by alternative closing of switches the configurable first H-bridge circuit in a second configuration as discrete switches to supply electricity to independent electrically-powered components.

32. (Previously Presented) A printing device as recited in claim 31, wherein:

the means to drive the first motor is a second H-bridge circuit of a multiple H-bridge circuit that includes the configurable first H-bridge circuit; and

the means to drive the second motor is a third H-bridge circuit of the multiple H-bridge circuit.

33. (Original) A printing device as recited in claim 31, further comprising means to couple the configurable H-bridge circuit to drive the third motor.

34. (Original) A printing device as recited in claim 31, further comprising means to couple a switch of the configurable H-bridge circuit as a component switch.

**IX. EVIDENCE APPENDIX**

None

**X. RELATED PROCEEDINGS APPENDIX**

Appellant submits that no copies currently exist of decisions rendered by a court or the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of section 41.37 with regard to Application Number 10/692,263.